

Blue lines indicate the area meeting the ISRA Criteria; dashed lines indicate the suggested buffer for use in the development of appropriate place-based conservation measures

BURRILL LAKE ISRA

Australia and Southeast Indian Ocean Region

SUMMARY

Burrill Lake is located on the south coast of New South Wales, Australia. It is a small estuary connected to the sea by a narrow channel. It is characterised by seagrass beds and sandy and muddy substrates. Within this area there are: **threatened species** (Estuary Stingray *Hemirhynchus fluviorum*); and **feeding areas** (e.g., Common Stingaree *Trygonoptera testacea*).

CRITERIA

Criterion A - Vulnerability; Sub-criterion C2 - Feeding Areas

— AUSTRALIA —

— 0-2 metres —

— 0.71 km² —





DESCRIPTION OF HABITAT

Burrill Lake is located on the south coast of New South Wales, Australia. It is a small estuary connected to the Pacific Ocean by a narrow channel (~3 km in length) in the south. A sand barrier fills the channel producing a periodical separation from the sea and a flood-tide delta in the central part of the estuary (Sloss et al. 2006). The area is characterised by seagrass beds and sandy and muddy substrates (Jones et al. 2003). It receives freshwater input from Stony Creek and is dominated by wave dynamics.

The area is permanently open to the sea with a tidal range of <0.3 m (Hutchings et al. 1978). Sea surface temperature ranges from ~13°C in August to ~27°C in January (Ajani et al. 2022).

This Important Shark and Ray Area is benthic and is delineated from inshore and surface waters (0 m) to 2 m based on the bathymetry of the area.

ISRA CRITERIA

CRITERION A - VULNERABILITY

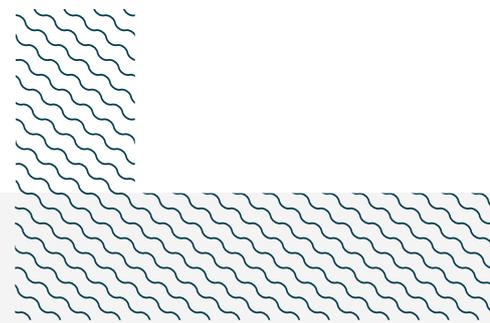
One Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species regularly occurs in the area. This is the Vulnerable Estuary Stingray (Hyde et al. 2025).

SUB-CRITERION C₂ - FEEDING AREAS

Burrill Lake is an important feeding area for two ray species.

Estuary Stingrays and Common Stingarees feed regularly and predictably in Burrill Lake (Grew 2025). Targeted drone surveys (transects and tracking of individual rays) were conducted between January 2022–May 2024 (Grew 2025). Transects (450 m straight) were conducted across the estuary at 30 m altitude and covered seagrass and bare substrates. A maximum of 16 transects were conducted per day. Locations identified during transect surveys were searched for Estuary Stingrays and Common Stingarees and when an individual was sighted the drone was moved to 5 m altitude and the individual was followed until it was lost or the battery ran out. Multiple observations were recorded for a single individual tracked. Between 30–50 individual tracks were conducted per season (Grew 2025).

In the transect surveys, 99 rays from both species were recorded (Grew 2025). Both species were mostly observed swimming (64 instances, 64.6%) with foraging being the second most commonly observed behaviour (19 instances, 19.2%). Individuals from both species were observed mostly around bare substrates (75 instances, 75.8%) compared to seagrass (24 instances, 24.2%). In addition, 120 Estuary Stingrays and 144 Common Stingarees were individually tracked. The most common behaviours for Estuary Stingrays were swimming (n = 94 observations, 32.6%) and foraging (n = 74, 25.7%) in bare substrates. For Common Stingarees, swimming was the most observed behaviour (n = 134 observations, 36.8%), followed by foraging (n = 90, 24.7%; Grew 2025). While the diet of both species was not assessed, in other regions (e.g., Wallis Lake), Estuary Stingrays use similar bare substrate habitats for feeding on highly abundant benthic fish and crustaceans that aggregate to spawn. Bare substrates may be a preferred habitat for both species due to the higher accessibility to prey compared to other substrates (Grew et al. 2025).



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We acknowledge the Traditional Owners of Country throughout Australia and recognise the continuing connection to land, waters, and culture. We pay our respects to Elders past, present, and emerging.

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QUALIFYING SPECIES

| Scientific Name | Common Name | IUCN Red List Category | Global Depth Range (m) | ISRA Criteria/Sub-criteria Met | | | | | | | | | |
|------------------------------|------------------|------------------------|------------------------|--------------------------------|---|----|----|----|----|----|----|----|--|
| | | | | A | B | C1 | C2 | C3 | C4 | C5 | D1 | D2 | |
| RAYs | | | | | | | | | | | | | |
| <i>Hemitrygon fluviorum</i> | Estuary Stingray | VU | 0-28 | X | | | X | | | | | | |
| <i>Trygonoptera testacea</i> | Common Stingaree | NT | 0-135 | | | | X | | | | | | |



REFERENCES

- Ajani P, Dove M, Farrel H, O'Connor W, Tesoreiro M, Verma A, Zammit A, Hughes B, Murray S. 2022.** Transforming Australian shellfish production: Long Island Harvest Area, Wallis Lake. Report on Stage 1, December 2017-March 2021. Sydney: University of Technology Sydney.
- Grew M. 2025.** Ray ecology and behaviour in estuarine systems: movement, diet and provision of ecosystem services. Unpublished PhD Thesis, University of Newcastle, Ourimbah.
- Grew M, Gaston TF, Griffin AS, Duce SJ, Raoult V. 2025.** Ray bioturbation rates suggest they shape estuary processes. *Remote Sensing in Ecology and Conservation* 11: 74-87. <https://doi.org/10.1002/rse2.411>
- Hutchings PA, Nicol PI, O'Gower AK. 1978.** The marine macrobenthic communities of Wallis and Smiths Lakes, New South Wales. *Australian Journal of Ecology* 3: 79-90. <https://doi.org/10.1111/j.1442-9993.1978.tb00854.x>
- Hyde CA, Rigby CL, Armstrong AO. 2025.** *Hemitygon fluviorum*. *The IUCN Red List of Threatened Species* 2025: e.T41797A248153151.
- Jones BG, Killian HE, Chenhall BE, Sloss CR. 2003.** Anthropogenic effects in a coastal lagoon: geochemical characterization of Burrill Lake, NSW, Australia. *Journal of Coastal Research*: 19: 621-632. <https://www.jstor.org/stable/4299203>
- Sloss CR, Jones BG, McClennen CE, Carli J De, Price DM. 2006.** The geomorphological evolution of a wave-dominated barrier estuary: Burrill Lake, New South Wales, Australia. *Sedimentary Geology* 187: 229-249. <https://doi.org/10.1016/j.sedgeo.2005.12.029>